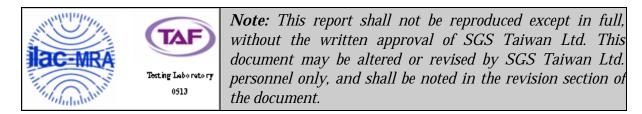


ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF			
Product Name:	Touch Remote		
Marketing Name:	N/A		
Brand Name:	Fortress		
Model No.:	FS99		
Model Difference:	N/A		
FCC ID:	CHXFS99TX915		
Report No.:	ER/2012/80024		
Issue Date:	Oct. 22, 2012		
FCC Rule Part:	§15.249		
Prepared for:	Crimestopper Security Products, Inc 1770 South Tapo St, Simi Valley, California 93063 USA		
Prepared by:	USA SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803		



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



VERIFICATION OF COMPLIANCE

Applicant:	Crimestopper Security Products, Inc 1770 South Tapo St, Simi Valley, California 93063 USA
Product Name:	Touch Remote
Marketing Name:	N/A
Brand Name:	Fortress
Model No.:	FS99
FCC ID:	CHXFS99TX915
Model Difference:	N/A
File Number:	ER/2012/80024
Date of test:	Aug. 27, 2012 ~ Oct. 16, 2012
Date of EUT Received:	Aug. 27, 2012

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd., Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Marcus Tseng	Date:	Oct. 22, 2012	
Prepared By:	Marcus Tseng/Engineer Uroletta Tang	Date:	Oct. 22, 2012	
Approved By:	Violetta Tang / Clerk Jim Chang	Date:	Oct. 22, 2012	

Jim Chang / Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Version

Version No.	Date	Description
00	Oct. 22, 2012	Initial creation of document

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

			,,
台灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	WW



Table of Contents

1. GEI	NERAL INFORMATION	
1.1	PRODUCT DESCRIPTION	5
	TEST METHODOLOGY	
	TEST FACILITY	
	EQUIPMENT MODIFICATIONS	
2. SYS	STEM TEST CONFIGURATION	7
	EUT CONFIGURATION	
	EUT EXERCISE	
	TEST PROCEDURE	
	LIMITATION	
	CONFIGURATION OF TESTED SYSTEM	
3. SUN	MMARY OF TEST RESULTS	11
		11
4. DES	SCRIPTION OF TEST MODES	
4. DES	SCRIPTION OF TEST MODES	11
	SCRIPTION OF TEST MODES CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP	
5. ME	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP	URIOUS RADIATION 11
5. ME 6. CO	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP	URIOUS RADIATION 11
 5. ME 6. COI 6.1 	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST Measurement Procedure:	URIOUS RADIATION 11
5. ME 6. CO 6.1 6.2	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST Measurement Procedure: Test SET-UP (Block Diagram of Configuration)	URIOUS RADIATION 11
5. ME 6. CO 6.1 6.2 6.3	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST Measurement Procedure: Test SET-UP (Block Diagram of Configuration) Measurement Equipment Used:	URIOUS RADIATION 11 12 12 12 12 13
5. ME 6. CO 6.1 6.2 6.3 6.4	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST Measurement Procedure: Test SET-UP (Block Diagram of Configuration) Measurement Equipment Used: Measurement Result:	URIOUS RADIATION 11 12 12 12 13 13
5. ME 6. CO 6.1 6.2 6.3 6.4	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST Measurement Procedure: Test SET-UP (Block Diagram of Configuration) Measurement Equipment Used:	URIOUS RADIATION 11 12 12 12 13 13
5. ME 6. CO 6.1 6.2 6.3 6.4	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST Measurement Procedure: Test SET-UP (Block Diagram of Configuration) Measurement Equipment Used: Measurement Result:	URIOUS RADIATION 11 12 12 12 13 13 16
 5. ME 6. COI 6.1 6.2 6.3 6.4 7. RAI 	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST	URIOUS RADIATION 11 12 12 12 12 13 13 16 16 16 16
5. ME 6. CON 6.1 6.2 6.3 6.4 7. RA 7.1 7.2 7.3	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST	URIOUS RADIATION 11 12 12 12 13 13 16 16 17
 5. ME 6. CON 6.1 6.2 6.3 6.4 7. RAI 7.1 7.2 7.3 7.4 	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST	URIOUS RADIATION 11 12 12 12 13 13 16 16 17 17
5. ME 6. CON 6.1 6.2 6.3 6.4 7. RA 7.1 7.2 7.3	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST	URIOUS RADIATION 11 12 12 12 13 13 16 16 17 17
5. ME 6. CON 6.1 6.2 6.3 6.4 7. RAN 7.1 7.2 7.3 7.4 7.5	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST	URIOUS RADIATION 11 12 12 12 12 13 13 13 16 16 16 17 17 18
5. ME 6. CON 6.1 6.2 6.3 6.4 7. RAN 7.1 7.2 7.3 7.4 7.5	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST	URIOUS RADIATION 11 12 12 12 12 13 13 13 14 15 16 16 17 17 18 26
 5. ME 6. CON 6.1 6.2 6.3 6.4 7. RAI 7.1 7.2 7.3 7.4 7.5 8. 20 I 	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST	URIOUS RADIATION 11 12 12 12 13 13 14 15 16 16 16 17 18 26 26 26 26
 5. ME 6. COI 6.1 6.2 6.3 6.4 7. RAI 7.1 7.2 7.3 7.4 7.5 8. 20 I 8.1 	CASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SP NDUCTED EMISSIONS TEST	URIOUS RADIATION 11 12 12 12 13 13 14 15 16 16 16 17 18 26 26 26 26

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



GENERAL INFORMATION 1.

1.1 Product Description

Product Name:	Touch Remote		
Marketing Name:	N/A		
Brand Name:	Fortress		
Model No.:	FS99		
Model Difference:	N/A		
Transmit Power	74.94 dBuV	//m	
Operation Frequency:	915MHz		
Channel number:	1 channel		
Modulation Type:	FSK		
Hardware Version:	N/A		
Software Version:	N/A		
Data Cable:	One provide, Model No.: N/A, Supplier: N/A		
	3.7Vdc by Lithium Cell battery		
Power Supply:	Battery: Model No.: H503030, Supplier: PSEBATTERY		
Antenna Designation:	Monopole Antenna		

This report complies with FCC 15.249

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and



1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: <u>CHXFS99TX915</u> filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2009). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2009. FCC Registration Number is: 990257 and 236194, Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the engineering operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7.3.1 of ANSI C63.4-2009.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2009.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



2.4 Limitation

(1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency	Conducted Limit (dBuV)		
(MHz)	Quasi-Peak	Average	
0.15 - 0.5	66 - 56	56 - 46	
0.5 – 5	56	46	
5 - 30	60	50	

(2) Radiated Emission 15.249(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m	500 uV/m	3
	(94dBuV/m)	(54dBuV/m)	
2400 - 2483.5	50 mV/m	500 uV/m	3
	(94dBuV/m)	(54dBuV/m)	
5725 - 5875	50 mV/m	500 uV/m	3
	(94dBuV/m)	(54dBuV/m)	
24.0 – 24.25 GHz	250 mV/m	2500 uV/m	3
	(107.95dBuV/m)	(67.95dBuV/m)	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



(3) Radiated Emission15.249 (d)

Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 as below, whichever is the lesser attenuation.

Frequency	Field strength	Distance (m)	Field strength at 3m
(MHz)	μV/m		dBµV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

(4) Radiated Emission 15.249(e)

For frequencies above 1000MHz, the above field strength limits are based on average limits. The peak filed strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

Remark: 1. Emission level in dBuV/m=20 log (uV/m)

- 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
- 3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205
- 4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ 15.205, then the general radiated emission limits in ξ 15.209 apply.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms_and_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
SGS Taiwan Ltd. No.134, WuKungRoad, NewTaipeiIndustrialPark, WukuDistrict, NewTaipeiCity, Taiwan24803/新北市五股區新北產業園區五工路 134 號



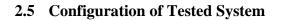


Fig. 2-1 Configuration (Radiated)

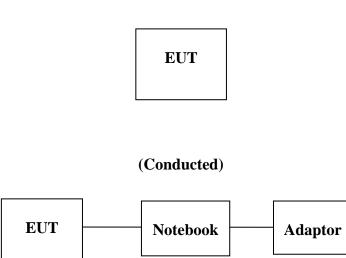


 Table 2-2 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.
1.	Notebook (Power Supply Only)	DELL	E5400	3704625136

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



3. Summary of Test Results

FCC Rules	Description Of Test	Result
§ 15.207	Conducted Emission	Compliant
§15.249(a)(e)	Radiated Emission	Compliant
§15.249(d)	20dB band width Measurement	Compliant

4. Description of test modes

The EUT has been tested under operating condition. The EUT is staying in continuous transmitting mode.

915MHz with highest data rate are chosen for full testing.

5. MEASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF SPURIOUS RADIATION

Measurement uncertainty (Polarization : Vertical)	30MHz - 180MHz: 3.37dB
	180MHz -417MHz: 3.19dB
	0.417GHz-1GHz: 3.19dB
	1GHz - 18GHz: 4.04dB
	18GHz - 40GHz: 4.04dB

Measurement uncertainty (Polarization : Horizontal)	30MHz - 167MHz: 4.22dB
	167MHz -500MHz: 3.44dB
	0.5GHz-1GHz: 3.39dB
	1GHz - 18GHz: 4.08dB
	18GHz - 40GHz: 4.08dB

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製

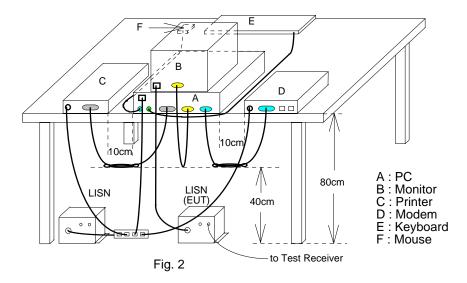


6. Conducted Emissions Test

6.1 Measurement Procedure:

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
ТҮРЕ		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCI7	100759	05/20/2011	05/19/2013			
EMI Receiver	R&S	ESCS 30	828985/004	09/23/2012	09/22/2013			
LISN	Rolf-Heine	NNB-2/16Z	99012	03/23/2012	03/22/2013			
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/23/2012	03/22/2013			
Coaxial Cables	N/A	WK CE Cable	N/A	01/05/2012	01/04/2013			

6.3 Measurement Equipment Used:

6.4 Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

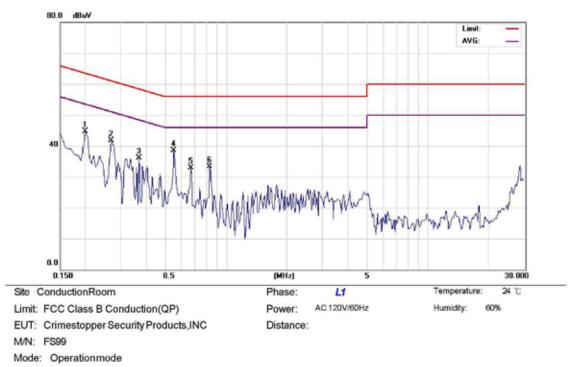
Test Result: Refer to next page for measurement data and plots.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode			Test Date:	Oct. 11, 2012
Temperature:	26	Humidity:	60 %	Test By:	Marcus



Note:

Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
	0.2000	44.55	0.12	44.67	63.61	-18.94	peak		
	0.2700	41.56	0.12	41.68	61.12	-19.44	peak		
	0.3700	35.98	0.12	36.10	58.50	-22.40	peak		
*	0.5500	38.37	0.12	38.49	56.00	-17.51	peak		
	0.6700	32.81	0.12	32.93	56.00	-23.07	peak		
	0.8300	33.10	0.12	33.22	56.00	-22.78	peak		
		MH2 0.2000 0.2700 0.3700 * 0.5500 0.6700	Mk. Freq. Level MH₂ dBuV 0.2000 44.55 0.2700 41.56 0.3700 35.98 * 0.5500 38.37 0.6700 32.81	Mk. Freq. Level Factor MHz dBuV dB 0.2000 44.55 0.12 0.2700 41.56 0.12 0.3700 35.98 0.12 * 0.5500 38.37 0.12 0.6700 32.81 0.12	Mk. Freq. Level Factor ment MHz dBuV dB dBuV 0.2000 44.55 0.12 44.67 0.2700 41.56 0.12 41.68 0.3700 35.98 0.12 36.10 * 0.5500 38.37 0.12 38.49 0.6700 32.81 0.12 32.93	Mk. Freq. Level Factor ment Limit MHz dBuV dB dBuV d	Mk. Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB dB dBuV dB dB <td< td=""><td>Mk. Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB Detector 0.2000 44.55 0.12 44.67 63.61 -18.94 peak 0.2700 41.56 0.12 41.68 61.12 -19.44 peak 0.3700 35.98 0.12 36.10 58.50 -22.40 peak * 0.5500 38.37 0.12 38.49 56.00 -17.51 peak 0.6700 32.81 0.12 32.93 56.00 -23.07 peak</td><td>Mk. Freq. Level Factor ment Limit Over MHz dBu/ dB dBu/ dBu/ dB Detector Comment 0.2000 44.55 0.12 44.67 63.61 -18.94 peak 0.2700 41.56 0.12 41.68 61.12 -19.44 peak 0.3700 35.98 0.12 36.10 58.50 -22.40 peak * 0.5500 38.37 0.12 38.49 56.00 -17.51 peak 0.6700 32.81 0.12 32.93 56.00 -23.07 peak</td></td<>	Mk. Freq. Level Factor ment Limit Over MHz dBuV dB dBuV dBuV dB Detector 0.2000 44.55 0.12 44.67 63.61 -18.94 peak 0.2700 41.56 0.12 41.68 61.12 -19.44 peak 0.3700 35.98 0.12 36.10 58.50 -22.40 peak * 0.5500 38.37 0.12 38.49 56.00 -17.51 peak 0.6700 32.81 0.12 32.93 56.00 -23.07 peak	Mk. Freq. Level Factor ment Limit Over MHz dBu/ dB dBu/ dBu/ dB Detector Comment 0.2000 44.55 0.12 44.67 63.61 -18.94 peak 0.2700 41.56 0.12 41.68 61.12 -19.44 peak 0.3700 35.98 0.12 36.10 58.50 -22.40 peak * 0.5500 38.37 0.12 38.49 56.00 -17.51 peak 0.6700 32.81 0.12 32.93 56.00 -23.07 peak

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

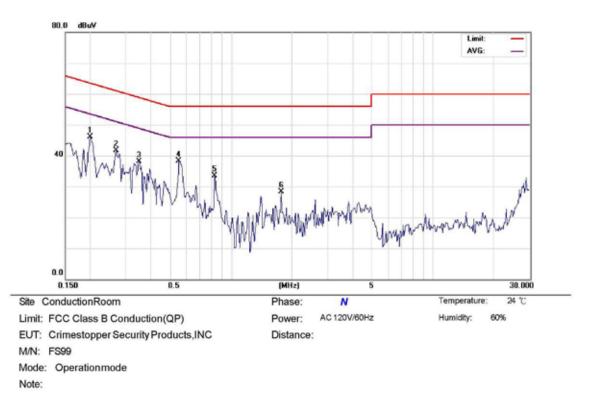
除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms_and_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
SGS Taiwan Ltd. No.134, WuKungRoad, NewTaipeiIndustrialPark, WukuDistrict, NewTaipeiCity, Taiwan24803/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488 www.tw.sgs.com



Report No.: ER/2012/80024 Issue Date: Oct. 22, 2012 Page: 15 of 27



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1 *	0.2000	45.98	0.13	46.11	63.61	-17.50	peak		
2	0.2700	41.48	0.13	41.61	61.12	-19.51	peak		
3	0.3500	38.05	0.12	38.17	58.96	-20.79	peak		
4	0.5500	38.17	0.12	38.29	56.00	-17.71	peak		
5	0.8300	33.28	0.13	33.41	56.00	-22.59	peak		
6	1.7800	28.06	0.15	28.21	56.00	-27.79	peak		

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <u>www.sgs.com/terms_and_conditions.htm</u> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <u>www.sgs.com/terms_e-document.htm</u>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
SGS Taiwan Ltd. No.134, WuKungRoad, NewTaipeiIndustrialPark, WukuDistrict, NewTaipeiCity, Taiwan24803/新北市五股區新北產業園區五工路 134 號

f (886-2) 2298-0488 www.tw.sgs.com



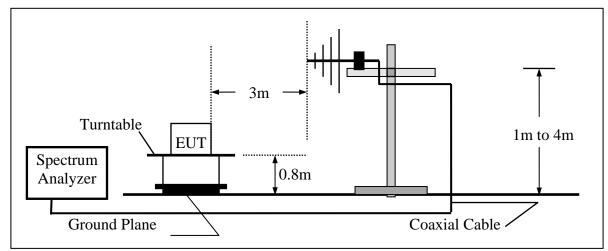
7. Radiated Emission Test

7.1 Measurement Procedure

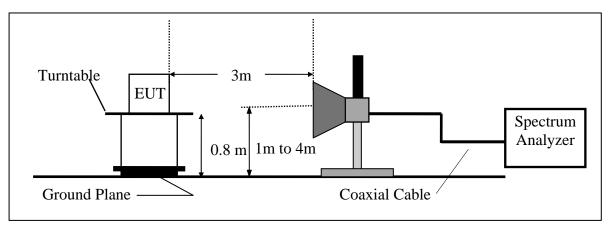
- 1. The EUT was placed on a turntable that is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4. Repeat above procedures until all frequency measured were complete.

7.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

台

	J	The second of the second of the second	
灣檢驗科技股份有限公司	t (886-2) 2299-3279	f (886-2) 2298-0488	www.tw.sgs.com



7.4 Measurement Equipment Used:

966 Chamber							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
EMI Test Receiver	R&S	ESCI7	100759	05/20/2011	05/19/2013		
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013		
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	02/15/2011	02/14/2013		
Spectrum Analyzer	R&S	FSV-30	101398	10/18/2011	10/17/2013		
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/10/2012	01/09/2014		
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2011	05/18/2013		
Horn Antenna	Schwarzbeck	BBHA9170	185	07/11/2011	07/10/2013		
Pre-Amplifier	Agilent	8447D	2944A07676	01/04/2012	01/03/2013		
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/04/2012	01/03/2013		
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M2	02/28/2012	02/28/2013		
Attenuator	Mini-Circuit	BW-S10W2+	004	02/28/2012	02/27/2013		
Turn Table	HD	DT420	N/A	N.C.R	N.C.R		
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R		
Controller	HD	HD100	N/A	N.C.R	N.C.R		
Low Loss Cable	Huber Suhner	966_Rx	9	01/04/2012	01/03/2013		
3m Site NSA	SGS	966 chamber	N/A	07/15/2012	07/14/2013		

7.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$\mathbf{FS} = \mathbf{RA} + \mathbf{AF} + \mathbf{CL} - \mathbf{AG}$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。





7.6 Measurement Result Radiated Spurious Emission Measurement Result (MAIN)

Operation Band	:915 MHz	Test Date	:2012-10-11
Fundamental Frequency	:915 MHz	Temp./Humi.	:24deg_C/60RH
Operation Mode	:TX MAIN	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:VERTICAL

Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)

Factor(dB) = Antenna Factor($dB\mu V/m$) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
915.00	F	Average	74.97	-2.52	72.45	93.97	-21.52
915.00	F	Peak	75.44	-2.52	72.92	114.00	-41.08

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Report No.: ER/2012/80024 Issue Date: Oct. 22, 2012 Page: 19 of 27

Operation Band	:915 MHz	Test Date	:2012-10-11
Fundamental Frequency	:915 MHz	Temp./Humi.	:24deg_C/60RH
Operation Mode	:TX MAIN	Engineer	:Marcus
EUT Pol.	:H PLAN	Measurement Antenna Pol.	:HORIZONTAL

Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)

Factor(dB) = Antenna Factor($dB\mu V/m$) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
915.00	F	Average	68.02	-2.52	65.50	93.97	-28.47
915.00	F	Peak	68.55	-2.52	66.03	114.00	-47.97

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Report No.: ER/2012/80024 Issue Date: Oct. 22, 2012 Page: 20 of 27

Operation Band	:915 MHz	Test Date	:2012-10-11
Fundamental Frequency	:915 MHz	Temp./Humi.	:24deg_C/60RH
Operation Mode	:TX MAIN	Engineer	:Marcus
EUT Pol.	:E1 PLAN	Measurement Antenna Pol.	:VERTICAL

Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)

Factor(dB) = Antenna Factor($dB\mu V/m$) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
915.00	F	Average	64.01	-2.52	61.49	93.97	-32.48
915.00	F	Peak	64.58	-2.52	62.06	114.00	-51.94

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Report No.: ER/2012/80024 Issue Date: Oct. 22, 2012 Page: 21 of 27

Operation Band	:915 MHz	Test Date	:2012-10-11
Fundamental Frequency	:915 MHz	Temp./Humi.	:24deg_C/60RH
Operation Mode	:TX MAIN	Engineer	:Marcus
EUT Pol.	:E1 PLAN	Measurement Antenna Pol.	:HORIZONTAL

Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)

Factor(dB) = Antenna Factor($dB\mu V/m$) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
915.00	F	Average	74.44	-2.52	71.92	93.97	-22.05
915.00	F	Peak	75.90	-2.52	73.38	114.00	-40.62

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or the content or the company.



Report No.: ER/2012/80024 Issue Date: Oct. 22, 2012 Page: 22 of 27

Operation Band	:915 MHz	Test Date	:2012-10-09
Fundamental Frequency	:915 MHz	Temp./Humi.	:24deg_C/60RH
Operation Mode	:TX MAIN	Engineer	:Marcus
EUT Pol.	:E2 PLAN	Measurement Antenna Pol.	:VERTICAL

Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)

Factor(dB) = Antenna Factor($dB\mu V/m$) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
915.00	F	Average	65.25	-2.52	62.73	93.97	-31.24
915.00	F	Peak	65.65	-2.52	63.13	114.00	-50.87

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Report No.: ER/2012/80024 Issue Date: Oct. 22, 2012 Page: 23 of 27

Operation Band	:915 MHz	Test Date	:2012-10-09
Fundamental Frequency	:915 MHz	Temp./Humi.	:24deg_C/60RH
Operation Mode	:TX MAIN	Engineer	:Marcus
EUT Pol.	:E2 PLAN	Measurement Antenna Pol.	:HORIZONTAL

Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)

Factor(dB) = Antenna Factor($dB\mu V/m$) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
915.00	F	Average	77.46	-2.52	74.94	93.97	-19.03
915.00	F	Peak	78.02	-2.52	75.50	114.00	-38.50

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



Report No.: ER/2012/80024 Issue Date: Oct. 22, 2012 Page: 24 of 27

Radiated Spurious Emission Measurement Result

Operation Band	:915 MHz	Test Date	:2012-10-09				
Fundamental Frequency	:915 MHz	Temp./Humi.	:24deg_C/60RH				
Operation Mode	:TX	Engineer	:Marcus				
EUT Pol.	:E2 PLAN	Measurement Antenna Pol.	:VERTICAL				
Actual FS($dB\mu V/m$) = S	Actual FS($dB\mu V/m$) = SPA. Reading level($dB\mu V$) + Factor(dB)						
Factor(dB) = Antenna Fac	$\cot(dB\mu V/m) + Cable Le$	oss(dB) – Pre_Amplifier Gain((dB)				
Note : "F" : denotes Fu	indamental Frequency.; "	H" : denotes Harmonic Frequence	cy.				
"E" : denotes Ba	and Edge Frequency.; "S" :	denotes Spurious Frequency.					
"" : denotes N	loise Floor.						

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
32.91	S	Peak	30.96	-14.24	16.72	40.00	-23.28
106.63	S	Peak	34.56	-16.09	18.47	43.50	-25.03
143.49	S	Peak	28.32	-12.82	15.50	43.50	-28.00
286.08	S	Peak	28.28	-12.89	15.39	46.00	-30.61
751.68	S	Peak	28.76	-4.93	23.83	46.00	-22.17
828.31	S	Peak	27.94	-3.90	24.04	46.00	-21.96
1830.00	Н	Peak	37.75	2.74	40.49	74.00	-33.51
2745.00	Н						
3660.00	Н						
4575.00	Н						
5490.00	Н						
6405.00	Н						
7320.00	Н						
8235.00	Н						
9150.00	Н						

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製



Report No.: ER/2012/80024 Issue Date: Oct. 22, 2012 Page: 25 of 27

Operation Band	:915 MHz	Test Date	:2012-10-09			
Fundamental Frequency	:915 MHz	Temp./Humi.	:24deg_C/60RH			
Operation Mode	:TX	Engineer	:Marcus			
EUT Pol.	:E2 PLAN	Measurement Antenna Pol.	:HORIZONTAL			
Actual FS($dB\mu V/m$) = SI	PA. Reading level(dBµV)	+ Factor(dB)				
Factor(dB) = Antenna Factor($dB\mu V/m$) + Cable Loss(dB) – Pre_Amplifier Gain(dB)						
Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.						

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
42.61	S	Peak	28.11	-13.63	14.48	40.00	-25.52
84.32	S	Peak	36.22	-17.77	18.45	40.00	-21.55
106.63	S	Peak	30.60	-16.09	14.51	43.50	-28.99
162.89	S	Peak	27.33	-12.52	14.81	43.50	-28.69
591.63	S	Peak	28.62	-7.73	20.89	46.00	-25.11
846.74	S	Peak	28.34	-3.72	24.62	46.00	-21.38
1830.00	Н	Peak	36.08	3.13	39.21	74.00	-34.79
2745.00	Н						
3660.00	Н						
4575.00	Н						
5490.00	Н						
6405.00	Н						
7320.00	Н						
8235.00	Н						
9150.00	Н						

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製



8. 20 dB Band Width Measurement

8.1 Measurement Procedure

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. Set ETU normal operating mode.
- 3. Set SPA Center Frequency = fundamental frequency, RBW = 100kHz, VBW = 300kHz, Span =1MHz.
- 4. Set SPA Max hold. Mark peak, -20dB.

8.2 Test SET-UP (Block Diagram of Configuration)

Same as 7.2 Radiated Emission Measurement.

8.3 Measurement Equipment Used:

Same as 7.4 Radiated Emission Measurement.

8.4 Measurement Results:

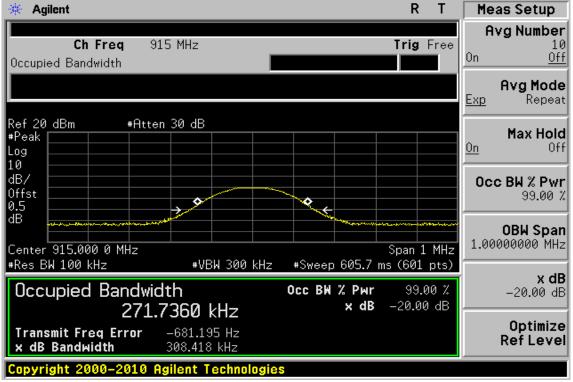
915 MHz = 308.418 kHz

Refer to attached data chart.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。



20dB Band Width Test Plot



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。